R Studio Overview

R Refresher
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Basic Questions

- What is R Studio?
  - An Integrated Development Environment (IDE) for the R programming language
- Why use it?
  - Full feature text editor
  - Easier to manage projects with many scripts
  - Easier access to files and directories on your computer
  - Easier to manage graphics
  - It's free and open-source

Main Components

- R Studio has four basic windows, or "panes"
  - Console
  - Source
  - Environment
  - Files
- Min/max with arrows or with the min/max buttons on the top right
- To change pane preferences…

Tools → Global Options → Pane Layout

Mac vs PC Keys in Shortcuts

Command Key (Mac) = **Control** Key (PC)

Option Key (Mac) = **Alt** Key (PC)

Console Pane

- Where you type code

- In the lower left corner by default

- Useful features
  - ⬆ scrolls through recent commands
  - Start typing a command, then...
    - Press **tab** for a list of available functions, variables, and data sets
    - To change behavior go to **tools → global options → code → completion**
    - **Command +** ⬆ to choose matching commands
  - Clear contents by typing **Control + L**

Source Pane

- Launched when you open file
  - New: **File → New File → R Script**
  - Existing: **File → Open File**
  - Recent: **File → Recent File**

- To save…
  - **File → Save**
  - **File → Save As**

Source Pane (cont.)

- **Tab completion** also works here

- R Studio applies **syntax highlighting** based on the file extension (.r, .py, .cpp, etc.)

- To modify font and font size: **Tools →Global Options → Appearance**

Running Code in the Source Pane

- Highlight code and...
  - **Command + Enter**
  - Click the **Run** button

- If you want to run the entire R script...
  - **Command + SHIFT + S**
  - Click the **Source** button
  - **Source with Echo** will print all output (versus only print statements)

Environment Pane

- A record of R session activity

- Two main tabs:
  - Environment (keeps track of all objects)
  - History (keeps track of all commands)

- All variables show up here

- There is a **global environment** as well as **package environments**

Environment Pane (cont.)

- You can save objects in an **.rdata file** by clicking the **Save** icon

- Load an **.rdata file** by clicking the **Folder** icon

- You can view as a **list** or **grid**

  – Use the grid view to delete individual objects

- **Import Dataset** will let you import through the R Studio GUI

- **Delete** all object with the **Broom** icon

The View() Funtion

- A data viewer for data frames, lists, and matrices

- Two ways to access:
  - View(data_object)
  - Click the name of the object in the **Environment** window

- Pop out using **Show in new window** button

- Lots of options for sorting and filtering within the view

Environment Pane (History Tab)

- Keeps track of all commands run in the session

- You can save your history in a **.rhistory file** by clicking the **Save** icon

- Load an **.rhistory file** by clicking the **Folder** icon

- **Delete** all history with the **Broom** icon

- **Highlight** a command and click the **X-file** icon to delete it

Environment Pane (History Tab)

- Run a command again by **highlighting** it and...
  - Pressing **Enter**

    or

  - Clicking the **To Console** icon

- Copy a command to the source pane by **highlighting** it and...
  - Pressing **Shift + Enter**

    or

  - Clicking the **To Source** icon

Files Pane

- Contains five tabs
  - Files
  - Plots
  - Packages
  - Help
  - Viewer

Files Tab

- Shows contents of your current working directory

- Open, create, rename and delete files

- Set a new working directory by clicking **More** and selecting **Set As Working Directory**

- Other ways to set the working directory:
  - setwd(path)
  - **Session → Set Working Directory** (MAC)
  - **Tools → Change Working Directory** (PC)

Plots Tab

- Displays results from R's plotting functions (**plot, hist, ggplot, xyplot**)

- Navigate using **Arrow** buttons

- Open in a new window with the **Zoom** button

- Use the **Broom** icon to delete all contents

- Use **Export** to save the plot in one of several formats (.png, .jpeg, .tiff, .bmp, .svg, .eps)

Packages Tab

- Shows all packages in both current session (checked) and in R generally

- To add a package to your session by…
  - Typing **`library(library_name)`** in the console
  - Checking the box (R will execute the library() function)

- To delete a package…
  - Uncheck the box and R will execute the 'detach' function
  - Uncheck the box next to the name

Help Tab

- Search for objects in the help tab search box

- Other ways to get help:
  - `help(function_name)`
  - `?glm`
  - Highlight object in source or console pane and click F1.

  __NOTE:__ the package containing the object must be loaded in your R session for R to know about it and find the help docs

- The tool bar has several options, including a search box for searching within help docs

Viewer Tab

- Similar to the plots tab, but displays HTML content (RMarkdown, shiny, HTML widgets w/ JavaScript, etc.)

- Will not be covered in this session

Coding in the Source Pane

- As you write your code in the source pane, diagnostics will add warning (⚠️) and error (❌) symbols in the margin

- There are many keyboard shortcuts
  – To see a complete list: **Option + Shift + K**
  – Press **Esc** to close

Code Snippets

- R Studio has several code snippets that will save you time
  - Type **`fun`** to see the function template
  - Type **`lib`** to see the library call template

- To see all code snippets or add your own: **Tools → Global Options → Code → Edit Snippets**

- There are common snippets for several languages

Other Useful Features

- Multiple Cursors
  - **Control + Option** and either ⬆ or ⬇ (or click on the line you want the extra cursor(s))
  - After this, anything you type will appear on all cursor lines

- Navigating and searching code:
  - Go to line: **Command + Shift + Option + G**
  - Search with regex: **Command + f**

Other Useful Features (cont.)

- Code folding
  - Braces and paired symbols cause small arrows to show in the margin
  - You can click these to collapse or expand code blocks (e.g., functions)
  - Close all folds: **Command + Option + o**
  - Open all folds: **Command + Shift + Option + O**

- Jump to matching braces: **Control + p**

- Drag tabs to reorder files in the source pane

R Studio Projects

- Using R Studio Projects has several advantages
  – Easy to import files
  – Reproducibility
  – Easier to collaborate with collegues
  – Environment and history are saved
  – Source pane remembers which files were open

- Working directory is automatically set when you create a new project

- **File → New Project** or click the **Project** icon